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RESEARCH ARTICLE

Feather mites (Acariformes, Astigmata) detected on some birds in Türkiye: new records and new host-parasite associations

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Abstract

Feather mite specimens (Astigmata: Analgoidea and Pterolichoidea) used in this study were collected from 29 dead bird individuals of various orders in Artvin, Erzurum, Rize, and Sakarya (Türkiye) during 2023–2024. As a result of ectoparasitic examination, 22 feather mite species were detected. Of the mite species detected, fourteen species (*Glaucalges attenuatus*, *Kramerella bubonis*, *Montesauria merulae*, *M. cylindrica*, *Pandalura cirrata*, *Picalgoides diaphanoxus*, *Proctophyllodes ateri*, *P. glandarinus*, *P. hipposideros*, *P. locustellae*, *P. microstylifer*, *P. picae*, *P. pinnatus*, and *Scutulanyssus ottuki*) are new records for the ectoparasitic fauna in Türkiye. Additionally, new host-parasite associations were revealed for *Gabucinia delibata*, *Hieracolichus ramosus*, and *Montesauria merulae* feather mite species.

Keywords

Analgoidea, Aves, Ectoparasite, fauna, Pterolichoidea, Türkiye.

Introduction

Studies of host-parasite relationships, especially those of mites and wild birds, have recently increased in Türkiye (Gürler et al. 2013, Per and Aktaş 2018). In parallel with this, it is seen that the ectoparasitic fauna associated with wild birds in Türkiye increases with each study conducted. In these studies, new species records and new

host-ectoparasite associations for the feather mite fauna of Türkiye are detected (Eren et al. 2023). According to the latest published checklist, the bird fauna in Türkiye consists of 500 species (Karataş et al. 2021). Therefore, the feather mite fauna in Türkiye is expected to show diversity and richness depending on the diversity of rich birds. Feather mites are generally thought to have evolved together with their hosts and are mostly host-specific organisms. Since it is accepted that each individual avian host has an average of 2–3 specific feather mites (Dabert and Mironov 1999), the expected feather mite fauna of Türkiye could be over 500. However, current studies on ectoparasites of wild birds in Türkiye are not extensive. Up to now, investigations of feather mite fauna conducted in Türkiye have reported about 60 species (Philips and Fain 1991, Özkan et al. 2017, Eren and Açıcı 2022, Eren et al. 2022, 2023).

This present work reports new records for the feather mite fauna of birds in Türkiye and reveal host-ectoparasite associations.

Materials and Methods

During the field studies in different locations in Türkiye (Artvin, Erzurum, Rize, and Sakarya) in 2023 and 2024, bird specimens found dead in nature and on highways were subjected to ectoparasitic examination (Table 1). The detected feather mite specimens were preserved in Eppendorf tubes containing 70% ethanol. Feather mite specimens were made transparent with lactophenol for a while, then mounted on microscopie slides in Hoyer's medium. All mounted slides were dried at room temperature for 1–2 weeks and sealed with colourless nail polish. Finally, ectoparasite specimens were identified under the light microscopes (MIC-B30/B Binocular Economic Microscope-Led-Achromat, Soif Optical Instruments Factory, China) and using relevant literature sources (Bonnet 1924, Dubinin 1953, Atyeo and Braasch 1966, Atyeo and Gaud 1970, Mack-Fira and Cristea 1966, Gaud 1957, 1980, 1983, Černý 1979, Gaud and Atyeo 1985, Chirov and Mironov 1987, Mironov 2006, 2011, 2012).

Results and Discussion

Superfamily Analgoidea Trouessart & Mégnin, 1884
Family Analgidae Trouessart & Mégnin, 1884
Subfamily Analginae Trouessart & Mégnin, 1884
Genus *Analges* Nitzsch, 1818

The genus *Analges* is the oldest feather mite genus and currently includes about 64 species, predominantly associated with birds in the order Passeriformes (Gaud 1974, Mironov 1985, Dabert et al. 2018, Pedroso and Hernandes 2018). Reliable species identification in *Analges* species is generally based on males, with exceptions for

some species easily recognisible, because females generally have a very uniform morphological appearance (Mironov 2019a; Dabert et al. 2022).

Up to now, the genus *Analges* was represented by 4 species in the fauna of Türkiye: *Analges mucronatus* Buchholz, 1969, *A. passerinus* (Linnaeus, 1758), *A. spiniger* Giebel, 1871, and *A. turdinus* Mironov, 1985 (Gürler et al. 2013, Per and Aktaş 2018, Eren and Açıcı 2022, Eren et al. 2022).

***Analges* sp.**

Materials examined. 2 females from flight and tail feathers ex the European Goldfinch *Carduelis carduelis* (Linnaeus, 1758) (Passeriformes: Fringillidae), Merkez District (Çoruh University, Merkez Campus), Artvin Province, Türkiye, 26 March 2023, coll. G. Eren. 2 females from flight feathers ex the Coal Tit *Periparus ater* (Linnaeus, 1758) (Aves: Passeriformes: Paridae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 25 October 2023, coll. G. Eren.

Subfamily Anomalginae Gaud & Atyeo, 1982

Genus *Strelkoviacarus* Dubinin, 1953

To date, the genus *Strelkoviacarus* includes five described species found to infest members of many avian orders (Coraciiformes, Piciformes, Galliformes, Strigiformes, and Passeriformes) (Trouessart and Neumann 1888, Dubinin 1953, Spory 1965, Hill et al. 1967, Gaud and Atyeo 1996, Mironov et al. 2010, Pedroso and Hernandes 2018).

In previous studies conducted in Türkiye, only *S. quadratus* has been reported from the Eurasian blackcap *Sylvia atricapilla* (Linnaeus, 1758) in Samsun (Gürler et al. 2013, Per and Aktaş 2018). The Coal Tit *Periparus ater* (Linnaeus, 1758) is a new host record for *S. quadratus*.

***Strelkoviacarus quadratus* (Haller, 1882)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Coal Tit *Periparus ater* (Linnaeus, 1758) (Passeriformes: Paridae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 25 October 2023, coll. G. Eren.

Family Proctophyllodidae Mégnin and Trouessart, 1884

Subfamily Proctophyllodinae Mégnin and Trouessart, 1884

Genus *Monojoubertia* Radford, 1950

The genus *Monojoubertia* consists of twelve described species from passerines of the families Dicaeidae, Fringillidae, and Petroicidae (Atyeo 1967, 1971, Atyeo and Gaud 1970). In previous studies conducted in Türkiye, *M. microphylla* has been reported on *Fringilla coelebs* in Samsun (Gürler et al. 2013, Eren et al. 2022).

***Monojoubertia microphylla* (Robin, 1877)**
Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian chaffinch *Fringilla coelebs* Linnaeus, 1758 (Passeriformes: Fringillidae), Borçka District (Zorlu Village), Artvin Province, Türkiye, 9 November 2023, coll. G. Eren.

Genus *Proctophyllodes* Robin, 1877

Proctophyllodes Robin, 1877 is the most specious genus among all feather mites (Astigmata: Analgoidea and Pterolichoidea). Up to now, approximately 200 described species are associated with bird species from many orders, especially the Passeriformes (Atyeo and Braasch 1966, Mironov 2012, 2019b, Sun et al. 2023). When we look at the feather mite species identified so far in Türkiye, *Proctophyllodes* species come first: *P. cetti* Badek, Mironov et Dabert, 2008, *P. clavatus* Fritsch, 1961, *P. doleophyes* Gaud, 1957, *P. lusciniae* Burdejnaja et Kivganov, 2009, *P. mesocaulus* Mack-Fira et Cristea-Nastasescu, 1968, *P. musicus* Vitzthum, 1922, *P. rubeculinus* (Koch, 1841), *P. scolopacinus* (Koch, 1842), *P. stylifer* (Buchholz, 1869), *P. sylviae* Gaud, 1957, and *P. troncatus* Robin, 1877 (Gürler et al. 2013, Per and Aktaş 2018, Eren and Açıcı 2022, Eren et al. 2023).

Among seven *Proctophyllodes* species detected in the present study, *P. ateri* Fritsch, 1961 (Fig. 1), *P. hipposideros* Gaud, 1958 (Fig. 2), *P. glandarinus* (Koch, 1841) (Fig. 3), *P. locustellae* Chirov et Mironov, 1987 (Fig. 4), *Proctophyllodes microstylifer* Mironov, 2012 (Fig. 5), *P. picae* (Koch, 1840) (Fig. 6), and *P. pinnatus* (Nitzsch, 1818) (Fig. 7), are new record for the feather mite fauna in Türkiye.

***Proctophyllodes ateri* Fritsch, 1961**
Materials examined. 4 males and 4 females from flight and tail feathers ex the Coal Tit *Periparus ater* (Linnaeus, 1758) (Passeriformes: Paridae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 25 October 2023, coll. G. Eren.

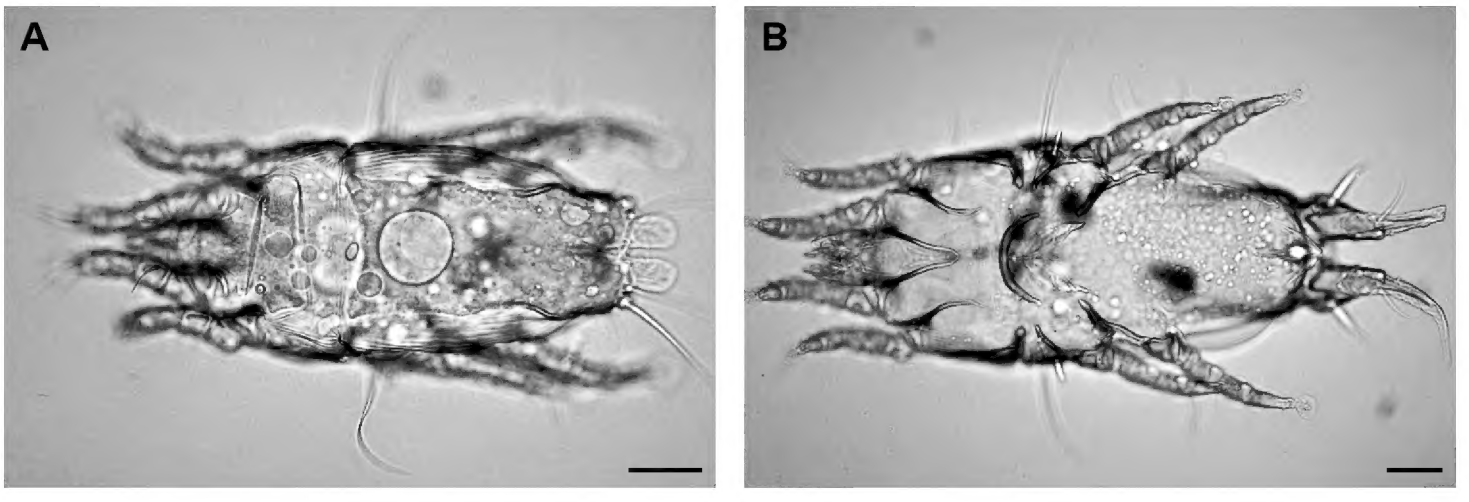

Figure 1. *Proctophyllodes ateri* — **A** Male, **B** Female (scale bars: 50 μm).

***Proctophyllodes hipposideros* Gaud, 1958**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Common Quail *Coturnix coturnix* (Linnaeus, 1758) (Galliformes: Phasianidae), Borçka District (Kaleköy Village), Artvin Province, Türkiye, 18 March 2023, coll. G. Eren.

Remark. *Proctophyllodes hipposideros* is commonly associated with various muscicapids of the genera *Oenanthe*, *Saxicola*, and *Phoenicurus* (Atyeo and Braasch 1966). The record of this species on the Common Quail is probably the result of accidental transfer from some muscicapid hosts living on the same biotope.

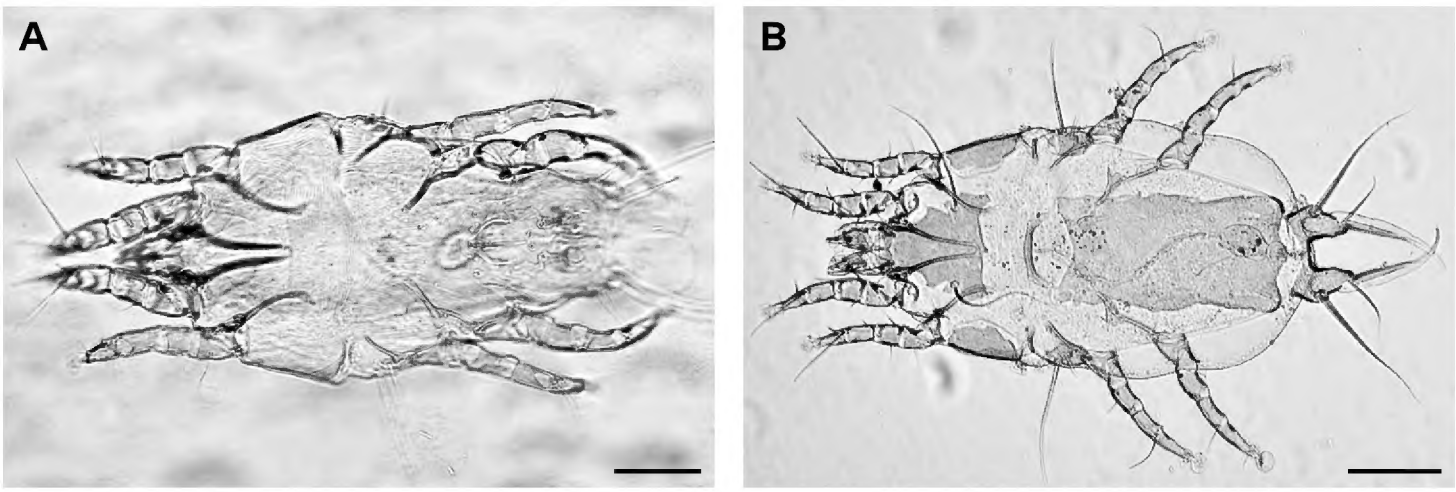

Figure 2. *Proctophyllodes hipposideros* — **A** Male, **B** Female (scale bars: 100 μm).

***Proctophyllodes glandarinus* (Koch, 1841)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian jay *Garrulus glandarius* (Linnaeus, 1758) (Passeriformes: Corvidae), Karasu District (Kuzuluk Neighbourhood-Tuzla Location), Sakarya Province, Türkiye, 1 February 2023, coll. G. Eren.

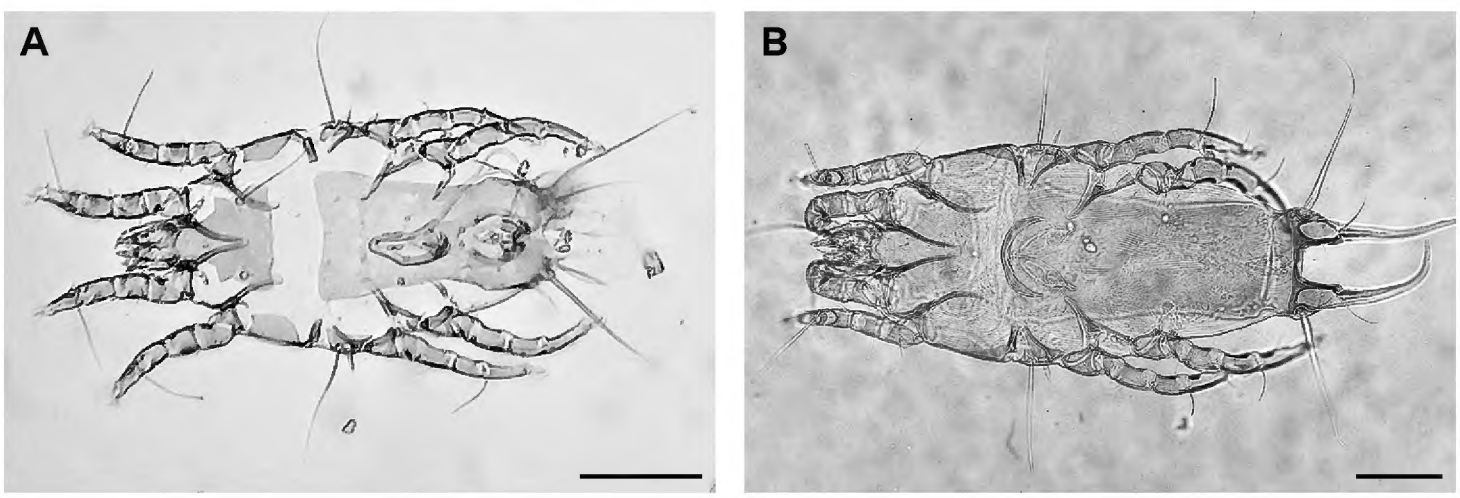

Figure 3. *Proctophyllodes glandarinus* — **A** Male, **B** Female (scale bars: 100 μm).

***Proctophyllodes locustellae* Chirov et Mironov, 1987**

Materials examined. 4 males and 4 females from flight and tail feathers ex the River Warbler *Locustella fluviatilis* (Wolf, 1810) (Passeriformes: Locustellidae), Borçka District (Merkez Neighbourhood), Artvin Province, Türkiye, 12 October 2023, coll. G. Eren.

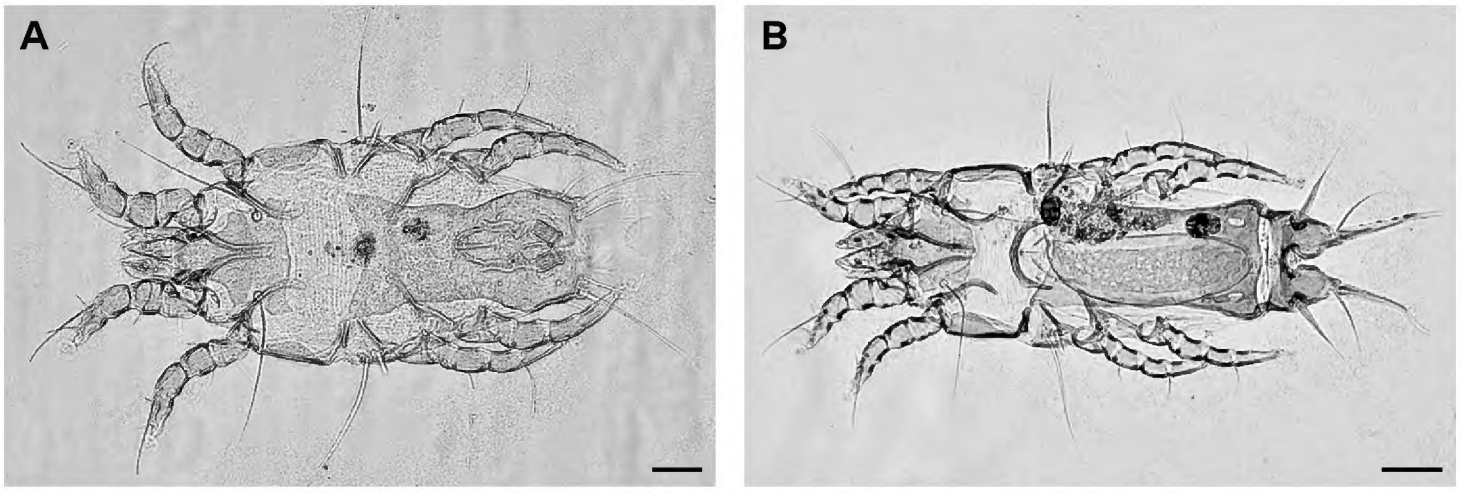

Figure 4. *Proctophyllodes locustellae* — **A** Male, **B** Female (scale bars: 100 μm).

***Proctophyllodes microstylifer* Mironov, 2012**

Materials examined. One female from flight and tail feathers ex the Eurasian Wren *Troglodytes troglodytes* (Linnaeus, 1758) (Passeriformes: Troglodytidae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 21 October 2023, coll. G. Eren.

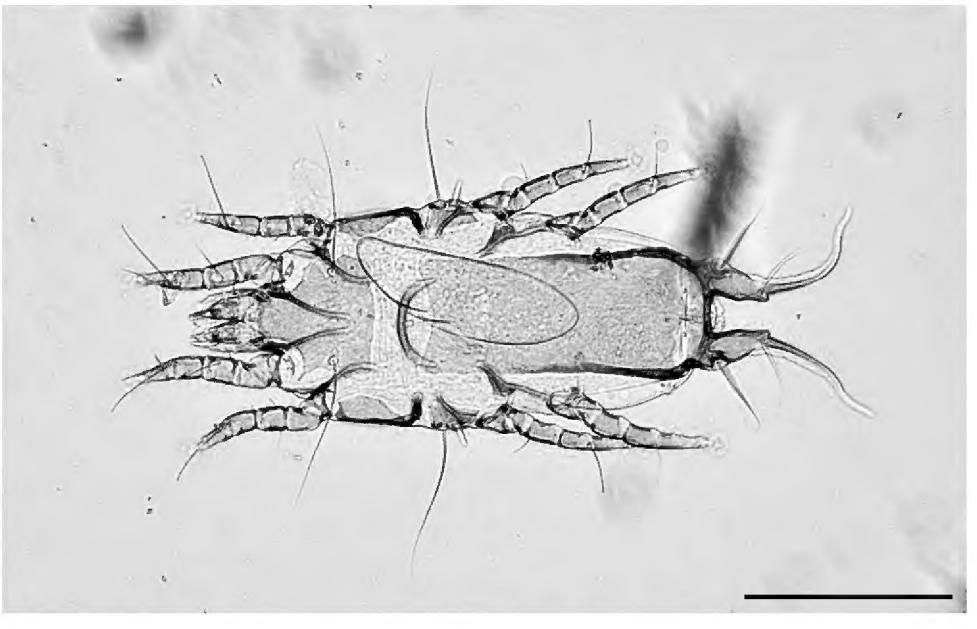

Figure 5. *Proctophyllodes microstylifer* — Female (scale bar: 200 μm).

***Proctophyllodes picae* (Koch, 1840)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Magpie *Pica pica* (Linnaeus, 1758) (Passeriformes: Corvidae), Yakutiye District, Erzurum Province, Türkiye, 23 May 2024, coll. G. Eren.

Figure 6. *Proctophyllodes picae* — Female (scale bar: 200 μm).

***Proctophyllodes pinnatus* (Nitzsch, 1818)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the European Goldfinch *Carduelis carduelis* (Linnaeus, 1758) (Passeriformes: Fringillidae), Merkez District (Çoruh University, Merkez Campus), Artvin Province, Türkiye, 26 March 2023, coll. G. Eren.

***Proctophyllodes scolopacinus* (Koch, 1842)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Woodcock *Scolopax rusticola* Linnaeus, 1758 (Charadriiformes: Scolopacidae), Borçka

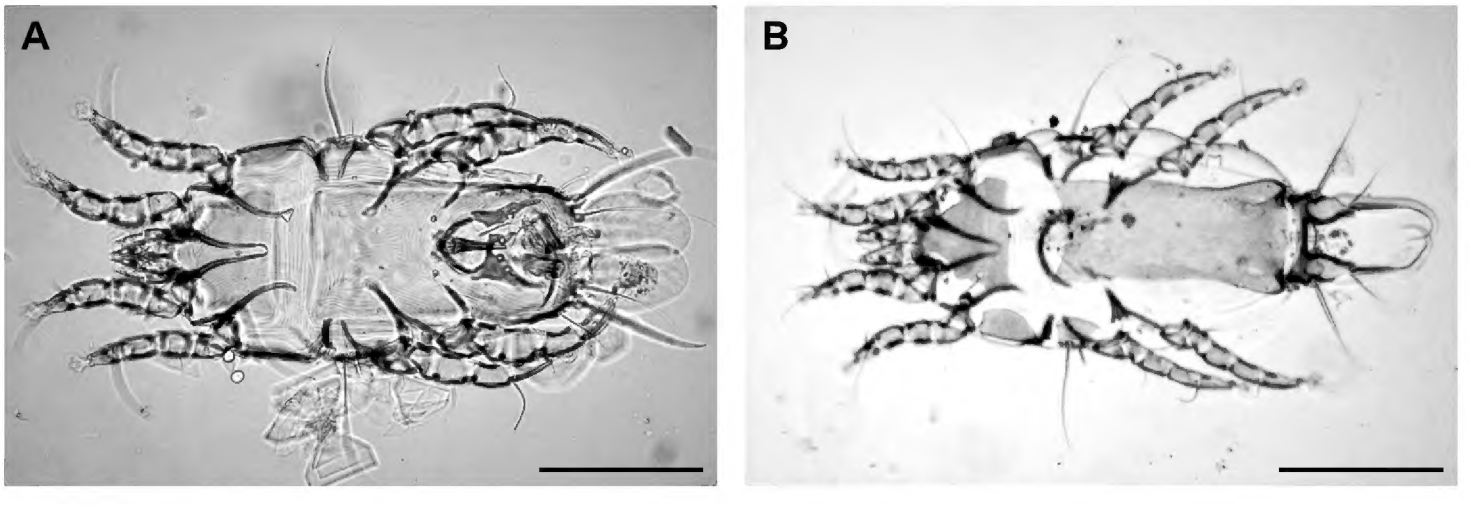

Figure 7. *Proctophyllodes pinnatus* — **A** Male (scale bar: 200 μm), **B** Female (scale bar: 100 μm).

District (Merkez Neighbourhood-Taşlıtarla Location), Artvin Province, Türkiye, 18 March 2023, coll. G. Eren.

***Proctophyllodes sylviae* Gaud, 1957**
Materials examined. 4 males and 6 females from flight and tail feathers ex the Eurasian blackcap *Sylvia atricapilla* (Linnaeus, 1758) (Passeriformes: Sylviidae), Borçka District (Gündoğdu Neighbourhood), Artvin Province, Türkiye, 04 July 2023, coll. G. Eren.

Subfamily Pterodectinae Park et Atyeo, 1971
Genus *Montesauria* Oudemans, 1905

The genus *Montesauria* includes over 66 described species associated with members of the order Passeriformes (Alaudidae, Dicruridae, Emberizidae, Estrildidae, Muscicapidae, Ploceidae, Pycnonotidae, Sturnidae, Sylviidae, and Turdidae) (Gaud and Mouchet 1957, Park and Atyeo 1971, Kuroki et al. 2006, Mironov 2006).

***Montesauria merulae* Gaud, 1957**
Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Jay *Garrulus glandarius* (Linnaeus, 1758) (Aves: Passeriformes: Corvidae), Karasu District (Kuzuluk Neighbourhood-Tuzla Location), Sakarya Province, Türkiye, 1 February 2023, coll. G. Eren.

***Montesauria cylindrica* (Robin, 1877)**
Materials examined. One female from flight and tail feathers ex the Hooded Crow *Corvus cornix* Linnaeus, 1758) (Aves: Passeriformes: Corvidae), Ardeşen District, Rize Province, Türkiye, 19 June 2024, coll. G. Eren.

Feather mite infestation of *Montesauria merulae* (Fig. 8) detected on the Eurasian Jay *G. glandarius* and *M. cylindrica* (Fig. 9) on the Hooded Crow *C. cornix* is a new record for the fauna of feather mites in Türkiye. *Montesauria merulae*

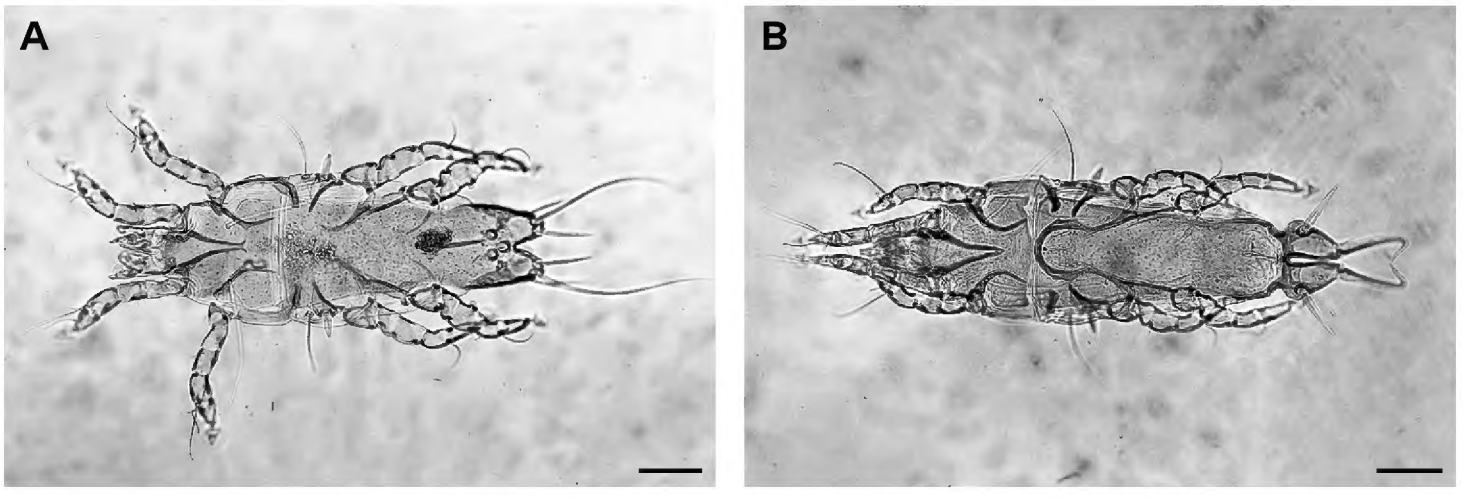

Figure 8. *Montesauria merulae* — **A** Male, **B** Female (scale bars: 100 μm).

commonly occurs on the common blackbird *Turdus merula* Linnaeus, 1758 and other thrushes (Gaud and Mouchet 1957; Atyeo and Braasch 1966). The symbiotic interaction between *M. merulae* and *G. glandarius* may have occurred due to natural contamination, because I detected a dense feather mite infrapopulation on both the wing and tail feathers. Comprehensive studies are required to understand whether this case of transfer was accidental or *M. merulae* is widely distributed on the Eurasian Jay in Türkiye.

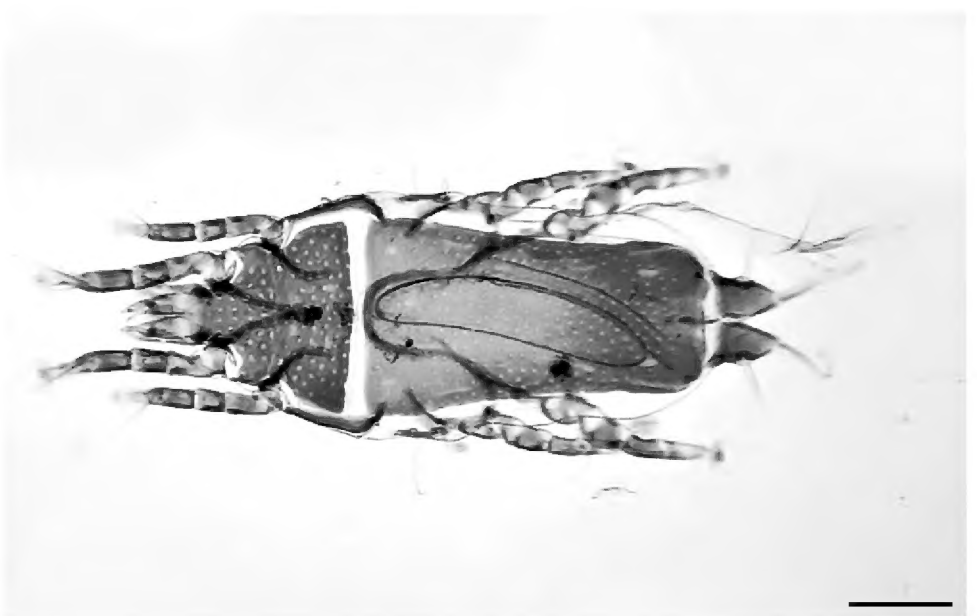

Figure 9. *Montesauria cylindrica* — Female (scale bar: 100 μm).

Family Psoroptoididae Gaud, 1958
Subfamily Pandalurinae Gaud et Atyeo, 1982
Genus *Pandalura* Hull, 1934

The genus *Pandalura* is currently represented by four described species associated with owls (Strigiformes) and nightjars (Caprimulgiformes) (Philips 2000, Mironov 2011).

***Pandalura cirrata* (Müller, 1860)**
Materials examined. 4 females from flight and tail feathers ex the Eurasian Eagle-Owl *Bubo bubo* (Linnaeus, 1758) (Strigiformes: Strigidae), Borçka District (Güneşli Village), Artvin Province, Türkiye, 05 January 2024, coll. G. Eren.

In this study, *Pandalura cirrata* detected on the Eurasian Eagle-Owl *B. bubo* is a new record for the fauna of feather mites in Türkiye (see in Fig. 10).

Genus *Picalgoides* Cerny, 1974
The feather mite *Picalgoides diaphanoxus* (originally *Mesalges diaphanoxus*) was first described by Bonnet (1924) from seven different hosts, including three species of ravens [*Corvus albus* (=*Corvus scapulatus*), *Corvus fuscicapillus* (=*Macrocorax fuscicapillus*), and *Corvus orru* (=*Corone orru*)], but no subsequent reports have been

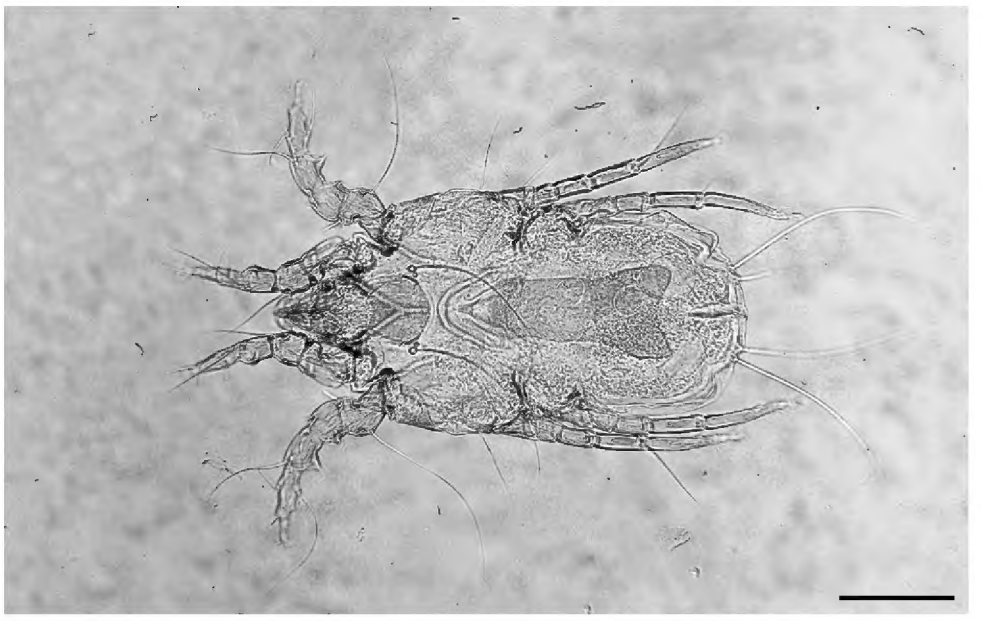

Figure 10. *Pandalura cirrata* — Female (scale bar: 100 μm).

made in the years that followed. Although the description of this species, identified as *Mesalges diaphanoxus* in the relevant publication, is brief and the illustrations are incomplete, it is possible to speculate on the genus or family to which this mite belongs. It is also evident that Bonnet's specimens were likely contaminated, as it is improbable for one mite species to occur on such diverse hosts from geographically distant regions. However, the fact that the mites were collected from three species of birds within the same genus provides evidence that these mites are associated with birds of the genus *Corvus*. Therefore, when a type host is not explicitly designated, as is common in such cases, the first-listed host should be fixed as the type host. Accordingly, *Corvus albus* should be considered the type host species (Sergey V. Mironov, personal communication). Compared to other feather mite families, members of the Pandalurinae family have not been adequately researched, and bird-feather mite diversity has not been revealed (Mironov 2004). The genus *Picalgoides* includes 12 currently described species associated with the orders Passeriformes (Corvidae and Furnariidae) and Piciformes (Indicatoridae, Megalaimidae, Picidae, and Ramphastidae) (Bonnet 1924, Mironov et al. 2011, Constantinescu et al. 2014, Mironov and Hernandes 2020, Present study).

The feather mite of *P. diaphanoxus* detected on the common raven *C. corax* is a new record for the fauna of feather mites in Türkiye (see in Fig. 11). It is also a new host-parasite association in the world.

***Picalgoides diaphanoxus* (Bonnet, 1924)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the common raven *Corvus corax* Linnaeus, 1758 (Passeriformes: Corvidae), Borçka District (Küçükköy Village), Artvin Province, Türkiye, 10 April 2023, coll. G. Eren.

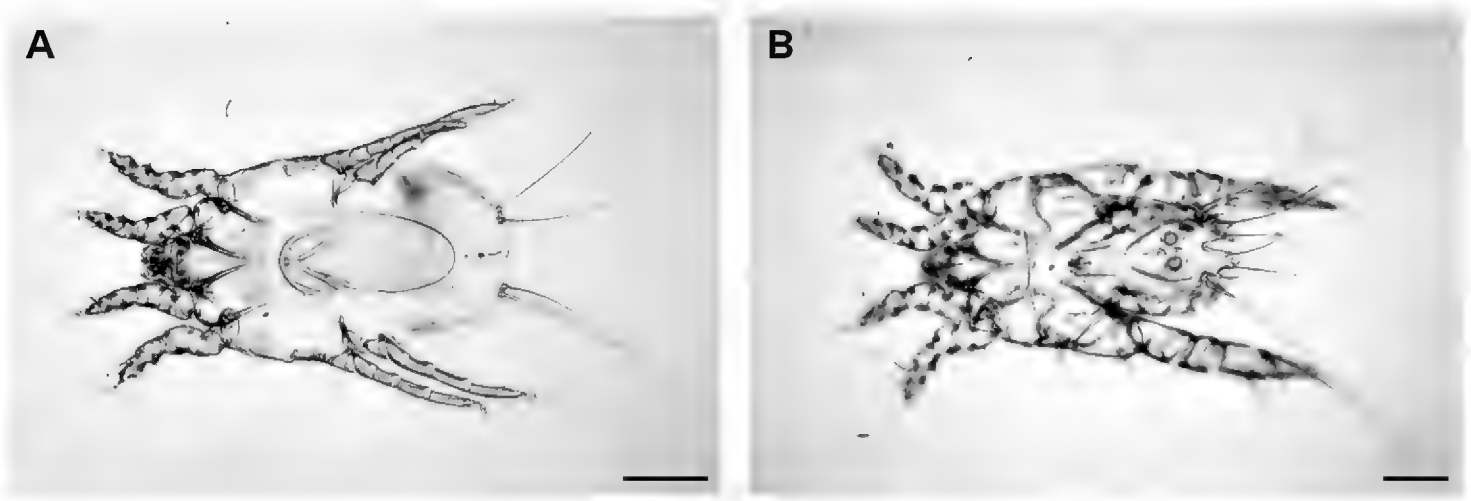

Figure 11. *Picalgoides diaphanoxus* — **A** Male, **B** Female (scale bars: 100 μm).

Family Pteronyssidae Oudemans, 1941
Genus *Pteronyssoides* Hull, 1931

The genus *Pteronyssoides* currently includes 32 species associated with birds of the order Passeriformes (Dicruridae, Emberizidae, Estrildidae, Fringillidae, Motacillidae, Nectariniidae, Paradisaeidae, Paridae, Passeridae, Ploceidae, Promeropidae, Pycnonotidae, Timaliidae, Turdidae, and Viduidae) (Faccini and Atyeo 1981, Mironov 1989, Mironov and Wauthy 2005, Mironov et al. 2016, Constantinescu et al. 2018).

In previous studies conducted in Türkiye, *P. striatus* has only been reported on the Eurasian Chaffinch *Fringilla coelebs* Linnaeus, 1758 (Aves: Passeriformes: Fringillidae) (Gürler et al. 2013, Eren et al. 2022).

Pteronyssoides striatus (Robin, 1977)

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Chaffinch *Fringilla coelebs* Linnaeus, 1758 (Aves: Passeriformes: Fringillidae), Borçka District (Zorlu Village), Artvin Province, Türkiye, 9 November 2023, coll. G. Eren.

Genus *Scutulanyssus* Mironov, 1985

The genus *Scutulanyssus* consists of 9 species associated exclusively with swallows (Hirundinidae) (Mironov 1985, 1989, Gaud and Atyeo 1985, Mironov and Galloway 2006). Previous studies in Türkiye have reported only *Scutulanyssus hirundicola* from the barn swallow *Hirundo rustica* (Linnaeus, 1758) (Gürler et al. 2013).

In the present study, *Scutulanyssus ottuki* detected on the western house martin *D. urbicum* are reported for the first time in Türkiye (see in Fig. 12).

Scutulanyssus ottuki (Chirov & Mironov, 1983)

Materials examined. 4 males and 4 females from flight and tail feathers ex the western house martin *Delichon urbicum* (Linnaeus, 1758) (Passeriformes: Hirundinidae),

Borçka District (Merkez Neighbourhood), Artvin Province, Türkiye, 1 July 2023, coll. G. Eren.

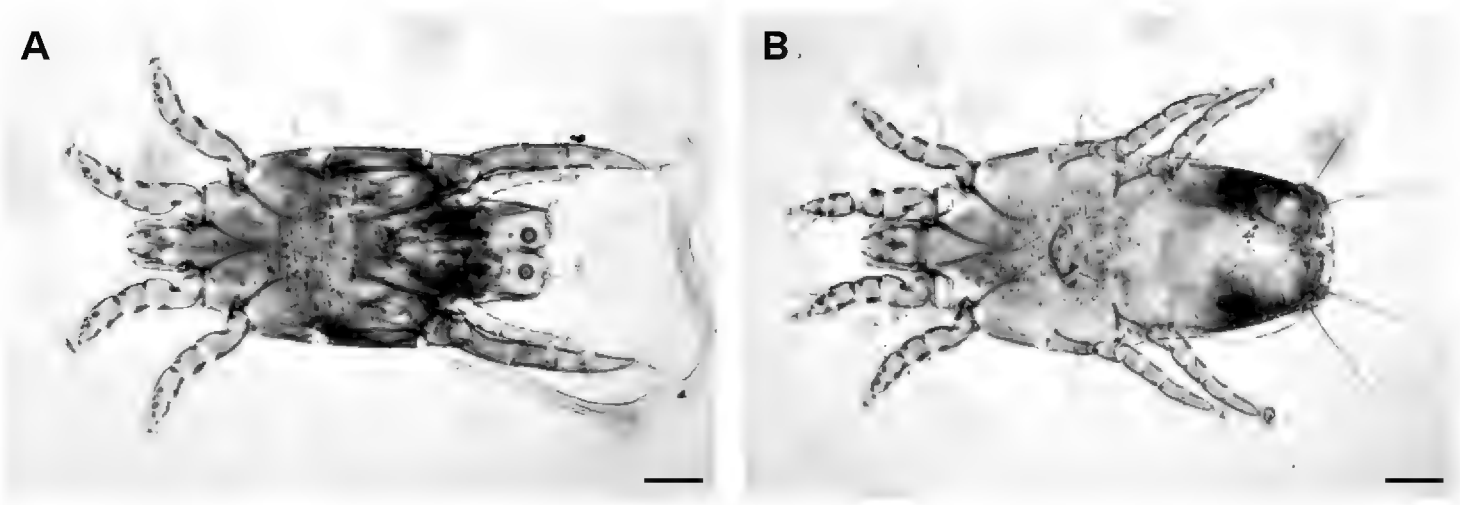

Figure 12. *Scutulanyssus ottuki* — **A** Male, **B** Female (scale bars: 100 μm).

Family Trouessartiidae Gaud, 1957
Genus *Trouessartia* Canestrini, 1899

The feather mite genus *Trouessartia* Canestrini, 1899, comprises approximately 150 species, found primarily on birds of the order Passeriformes, with a smaller number occurring on birds of the order Piciformes (Lybiidae and Picidae) (Santana 1976, Gaud 1993, Gaud and Atyeo 1996, Hernandes 2014, Mironov and Bermúdez 2017). Although it has been reported from birds of the orders Charadriiformes, Gruiformes, and Psittaciformes, these records are most likely the result of contamination (Mironov 2022).

Studies conducted so far in Türkiye (Gürler et al. 2013, Per and Aktaş 2018) have reported eight species of this genus: *T. bifurcata* (Trouessart, 1884) from the Eurasian Blackcap *Sylvia atricapilla* (Linnaeus, 1758), the Cetti's Warbler *Cettia cetti* Temminck, 1820, and the Great Reed Warbler *Acrocephalus arundinaceus* (Linnaeus, 1758); *T. inexpectata* Gaud, 1957 from the Common Chiffchaff *Phylloscopus collybita* (Vieillot, 1817), the Eurasian Blackcap *S. atricapilla* (Linnaeus, 1758), and the Sardinian Warbler *Curruca melanocephala* (Gmelin, JF, 1789); *T. jedliczkai* (Zimmermann 1894) from the White Wagtail *Motacilla alba* Linnaeus, 1758; *T. kratochvili* Cerny, 1963 from the Savi's Warbler *Locustella luscinioides* (Savi, 1824); *T. microcaudata* Mironov, 1983 from the Barn Swallow *Hirundo rustica* Linnaeus, 1758; *T. reguli* Mironov, 1983 from the Goldcrest *Regulus regulus* (Linnaeus, 1758); *T. rubecula* Jablonska, 1968 from the European Robin *Erithacus rubecula* (Linnaeus, 1758); *T. trouessarti* Oudemans, 1904 from the Great Reed Warbler *A. arundinaceus* (Linnaeus, 1758), and the Common Reed Warbler *Acrocephalus scirpaceus* (Hermann, 1804).

The River Warbler *Locustella fluviatilis* (Wolf, 1810) is a new host record for *T. kratochvili* Cerny, 1963 in Türkiye (see in Fig. 13).

***Trouessartia kratochvili* Cerny, 1963**

Materials examined. 4 males and 4 females from flight and tail feathers ex the River Warbler *Locustella fluviatilis* (Wolf, 1810) (Passeriformes: Locustellidae), Borçka District (Merkez Neighbourhood), Artvin Province, Türkiye, 12 October 2023, coll. G. Eren.

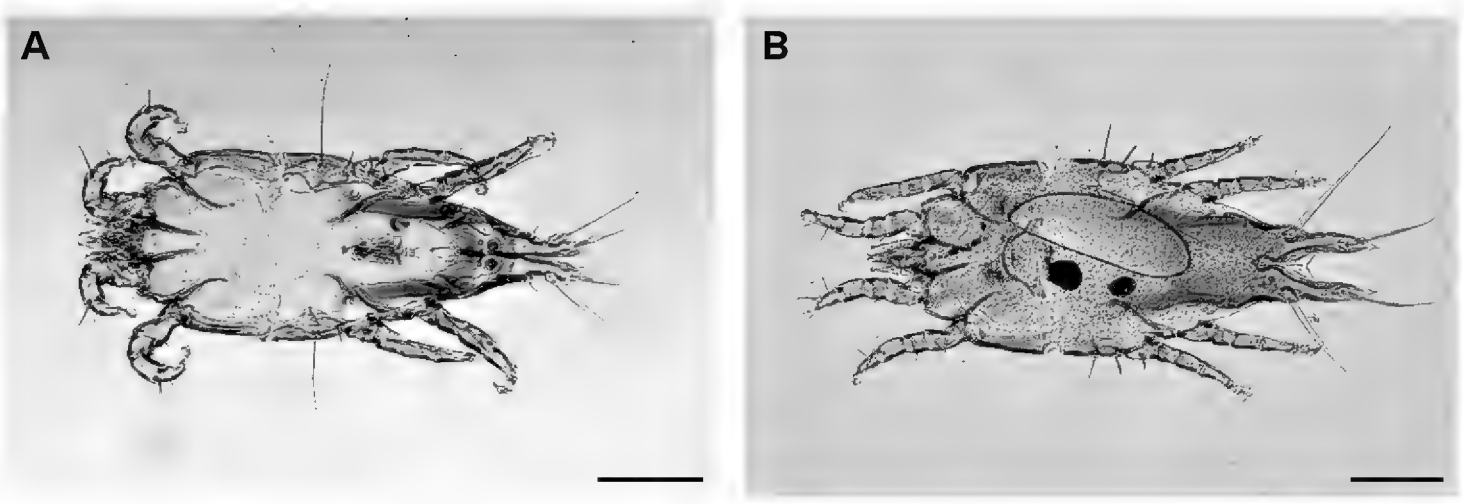

Figure 13. *Trouessartia kratochvili* — **A** Male, **B** Female (scale bars: 200 μm).

Family Xolalgidae Dubinin, 1953

Subfamily Ingrassiinae Gaud & Atyeo, 1981

Genus *Glaucalges* Gaud, 1980

The genus *Glaucalges* contains three described species: two species are associated with owls (Strigiformes: Strigidae and Tytonidae) and one species is known from turacos (Musophagiformes: Musophagidae) (Dabert et al. 2008). *Glaucalges attenuatus* (Buchholz, 1869) and *G. tytonis* Dabert et al., 2008 are species that have been reported in different locations and on different owl species (Gaud 1980, Philips 2000). However, the third species *G. pteropus* (Gaud et Mouchet 1959) was detected in only one location and a single host (Gaud and Mouchet 1959).

In the present study, *G. attenuatus* detected on the Eurasian Eagle-Owl *B. bubo* (Linnaeus, 1758) is reported for the first time in Türkiye (see in Fig. 14).

***Glaucalges attenuatus* (Buchholz, 1869)**

Materials examined. 2 males from flight and tail feathers ex the Eurasian Eagle-Owl *Bubo bubo* (Linnaeus, 1758) (Aves: Strigiformes: Strigidae), Borçka District (Güneşli Village), Artvin Province, Türkiye, 05 January 2024, coll. G. Eren.

Table 1. Feather mites detected on the avian hosts examined.

Bird species (examined/infested)	Bird orders	Bird families	Feather mite species
Coturnix coturnix (1/1)	Galliformes	Phasianidae	*Proctophyllodes hipposideros**
Scolopax rusticola (1/1)	Charadriiformes	Scolopacidae	*Proctophyllodes scolopacinus*
Asio otus (1/0)	Strigiformes	Strigidae	-
Bubo bubo (1/1)			*Pandalura cirrata** *Glaucalges attenuatus** *Kramerella bubonis**
Buteo buteo (1/0)	Accipitriformes	Accipitridae	-
Buteo rufinus (1/1)			*Hieracolichus ramosus***
Falco tinnunculus (1/0)	Falconiformes	Falconidae	-
Nycticorax nycticorax (1/0)	Pelecaniformes	Ardeidae	-
Merops apiaster (1/0)	Coraciiformes	Meropidae	-
Corvus corax (1/1)	Passeriformes	Corvidae	*Gabucinia delibata*** *Picalgoides diaphanoxus**
Corvus cornix (1/1)			*Gabucinia delibata*** *Montesauria cylindrica**
Garrulus glandarius (1/1)			*Montesauria merulae** *Proctophyllodes glandarinus**
Pica pica (3/1)			*Proctophyllodes picae**
Carduelis carduelis (1/1)		Fringillidae	*Analges* sp. *Proctophyllodes pinnatus**
Fringilla coelebs (1/1)			*Monojoubertia microphylla* *Pteronyssoides striatus*
Delichon urbicum (1/1)		Hirundinidae	*Scutulanyssus ottuki**
Lanius collurio (1/0)		Laniidae	-
Locustella fluviatilis (1/1)		Locustellidae	*Proctophyllodes locustellae** *Trouessartia kratochvili*
Erithacus rubecula (1/0)		Muscicapidae	-
Periparus ater (1/1)		Paridae	*Proctophyllodes ateri** *Strelkoviacarus quadratus* *Analges* sp.
Passer domesticus (1/0)		Passeridae	-
Phylloscopus collybita (1/0)		Phylloscopidae	-
Prunella modularis (1/0)		Prunellidae	-
Sylvia atricapilla (1/1)		Sylviidae	*Proctophyllodes sylviae* *Strelkoviacarus quadratus*
Troglodytes troglodytes (1/1)		Troglodytidae	*Proctophyllodes microstylifer**
Turdus merula (1/0)		*Turdidae*	-
Turdus philomelos (2/0)			-

Remarks. *—new record for the Türkiye's fauna, **—new host-parasite association.

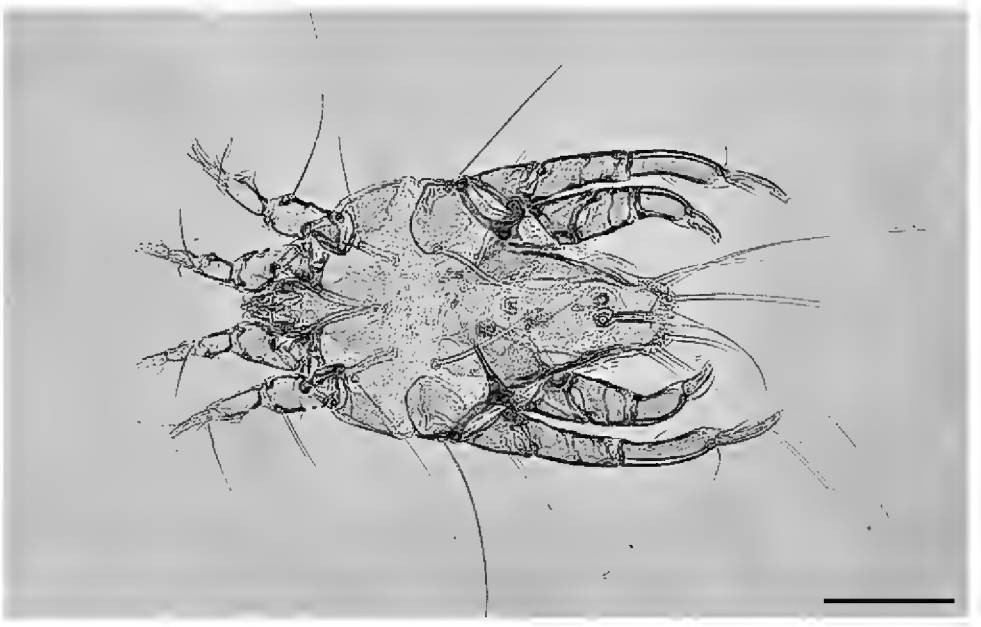

Figure 14. *Glaucalges attenuatus* — Male (scale bar: 100 μm).

Superfamily Pterolichoidea Trouessart and Mégnin, 1884
Family Gabuciniidae Gaud and Atyeo, 1974
Genus *Gabucinia* Oudemans, 1905

The genus *Gabucinia* Oudemans, 1905, consists of three species identified from the members of the family of Corvidae (crows) belonging to the order Passeriformes (Gaud and Atyeo 1974, Hernandes 2020).

In previous studies conducted in Türkiye, *G. delibata* has only been reported on the Hooded Crow, *Corvus cornix* Linnaeus, 1758 (Passeriformes: Corvidae) (Eren et al. 2023). Therefore, the Common Raven *C. corax* Linnaeus, 1758 is a new host record for *G. delibata* (Robin, 1877) in Türkiye.

Gabucinia delibata (Robin, 1877)

Materials examined. 4 males and 4 females from flight and tail feathers ex the Common Raven *Corvus corax* Linnaeus, 1758 (Aves: Passeriformes: Corvidae), Borçka District (Küçükköy Village), Artvin Province, Türkiye, 10 April 2023, coll. G. Eren.

Genus *Hieracolichus* Gaud and Atyeo, 1975

The genus *Hieracolichus* includes ten described species related to birds in the order Accipitriformes (seven species from African raptors) (Gaud 1983, Gaud and Atyeo 1974, Hernandes 2017, 2020). In studies conducted to date, *Hieracolichus ramosus* has been reported from the European Honey Buzzard *Pernis apivorus* (Linnaeus, 1758) (Philips 2000).

In previous studies conducted in Türkiye, *H. ramosus* has been reported on Honey Buzzard *Pernis apivorus* (Linnaeus, 1758) (Accipitriformes: Accipitridae) (Eren et al. 2022). Therefore, the Long-Legged Buzzard (*B. rufinus*) (Cretzschmar, 1829) is a new host record for *H. ramosus* in both Türkiye and world (see in Fig. 15).

***Hieracolichus ramosus* (Gaud et Mouchet, 1959)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Long-Legged Buzzard (*Buteo rufinus*) (Cretzschmar, 1829) (Accipitriformes: Accipitridae), Borçka District (Camili Village), Artvin Province, Türkiye, 9 May 2024, coll. G. Eren.

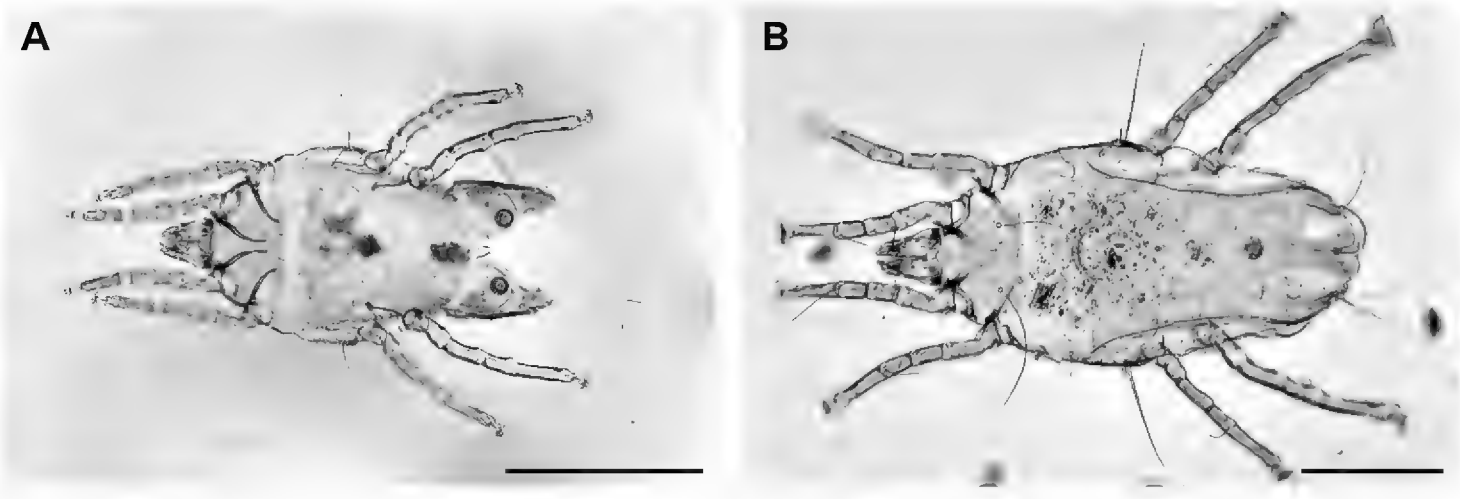

Figure 15. *Hieracolichus ramosus* —A. Male, B. Female (scale bars: 200 μm).

Family Kramerellidae Gaud and Mouchet, 1961

Genus *Kramerella* Trouessart, 1916

The genus *Kramerella* currently consists of ten species associated with owl species of the orders Strigiformes (Dubinin 1953, Gaud 1980, Gaud and Atyeo 1996, Černý and Wiesner 1992); two of these species were detected from some owl species in previous study conducted in Türkiye: *Kramerella aluconis* (Lönnfors, 1937) on the Tawny Owl *Strix aluco* Linnaeus, 1758 (Strigiformes: Strigidae) and *K. lunulata* (Haller, 1878) on the Little Owl *Athene noctua* (Scopoli, 1769) (Strigiformes: Strigidae) (Eren et al. 2023).

In the present study, *K. bubonis* detected on the Eurasian Eagle-Owl *B. bubo* (Linnaeus, 1758) is reported for the first time in Türkiye (see in Fig. 16).

***Kramerella bubonis* (Lönnfors, 1937)**

Materials examined. 4 males and 4 females from flight and tail feathers ex the Eurasian Eagle-Owl *Bubo bubo* (Linnaeus, 1758) (Strigiformes: Strigidae), Borçka District (Güneşli Village), Artvin Province, Türkiye, 05 January 2024, coll. G. Eren.

The data obtained in this study, including new faunistic records and novel host–parasite associations, represent a significant contribution to understanding the diversity, distribution, and host relationships of feather mites in Türkiye. With the addition of 14 species reported herein, the known feather mite fauna of Türkiye now comprises over 70 species across 38 genera and 15 families. To achieve a more comprehensive understanding of this fauna, further systematic studies should be conducted across various geographical regions of the country.

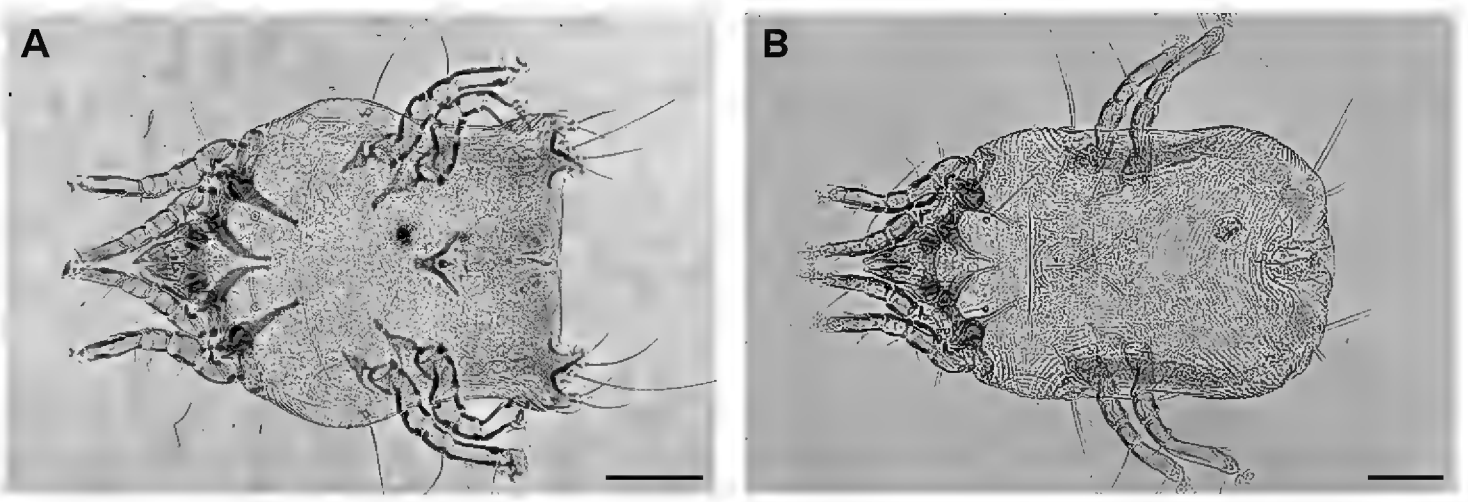

Figure 16. *Kramerella bubonis* — **A** Male (scale bar: 50 μm), **B** Female (scale bar: 100 μm).

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